Volunteer Lake Assessment Program Individual Lake Reports

SUNRISE LAKE, MIDDLETON, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	2,112	**Max. Depth (m):**	4.1	**Flushing Rate (yr^{-1})**	2
Surface Area (Ac.):	257	**Mean Depth (m):**	1.9	**P Retention Coef:**	0.71
Shore Length (m):	5,500	**Volume (m^3):**	1,966,000	**Elevation (ft):**	666

TROPHIC CLASSIFICATION

Year	Trophic class
1977	OLIGOTROPHIC
1990	MESOTROPHIC

KNOWN EXOTIC SPECIES

Variable Milfoil

The Waterbody Report Card tables are generated from the 2012 305(b) report on the status of N.H. waters, and are based on data collected from 2001-2011.

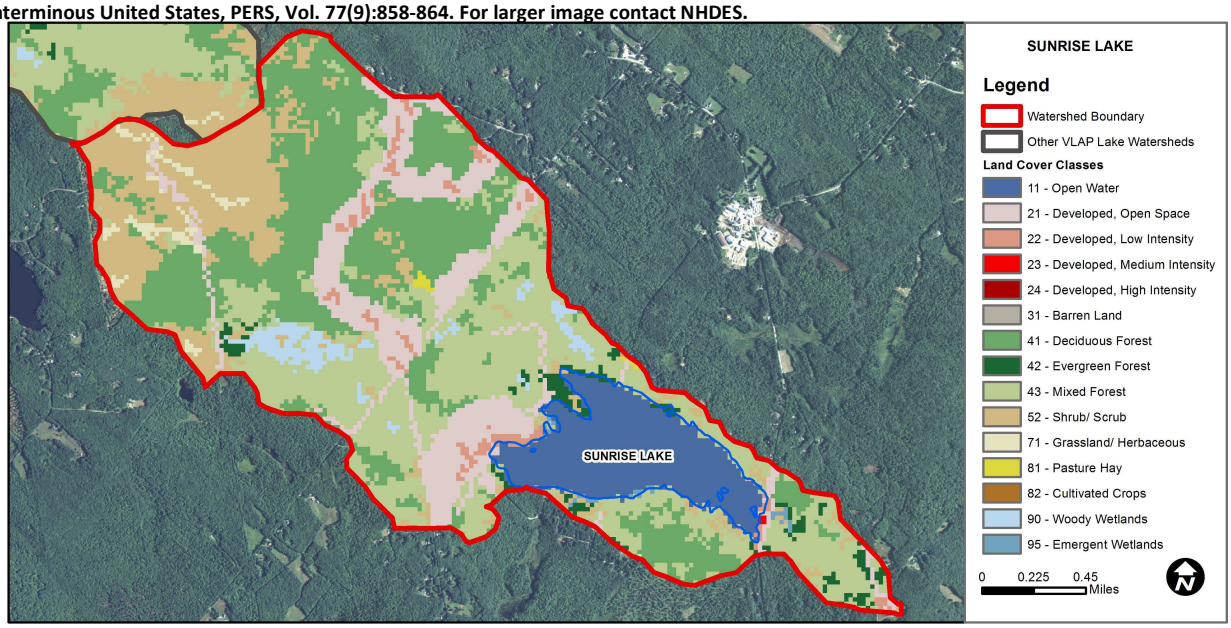
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Slightly Bad	>/=5 samples and median is >threshold.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	D.O. (mg/L)	Cautionary	< 10 samples and 1 exceedance of criteria. More data needed.
	D.O. (% sat)	Cautionary	< 10 samples and 1 exceedance of criteria. More data needed.
	Chlorophyll-a	Slightly Bad	>5 samples and median is > threshold.
Primary Contact Recreation	E. coli	Good	Geometric means < criteria; however at least 1 exceedance of the single sample criteria occurred.
	Chlorophyll-a	Very Good	At least 10 samples with 0 exceedances of criteria.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

SUNRISE LAKE - TOWN BEACH	E. coli	Bad	>/=1 exceedance(s) of geometric mean criterion and/or >/=2 exceedances of single sample criterion, with 1 or more >2X criteria.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.

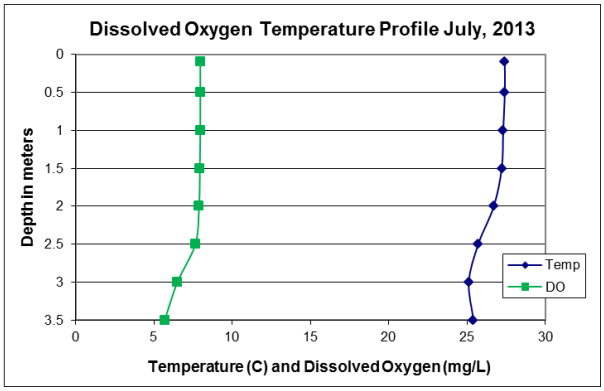


Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	10.2	Barren Land	0	Grassland/Herbaceous	1.14
Developed-Open Space	13.2	Deciduous Forest	27.25	Pasture Hay	0.2
Developed-Low Intensity	1.75	Evergreen Forest	2.04	Cultivated Crops	0
Developed-Medium Intensity	0.04	Mixed Forest	26.96	Woody Wetlands	2.24
Developed-High Intensity	0	Shrub-Scrub	14.68	Emergent Wetlands	0.28

VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS
SUNRISE LAKE, MIDDLETON, NH
2013 DATA SUMMARY

OBSERVATIONS AND RECOMMENDATIONS (*Refer to Table 1 and Historical Deep Spot Data Graphics)*

- **CHLOROPHYLL-A:** Chlorophyll levels were approximately equal to the state median and consistent with 2012 levels. Visual analysis of historical data indicates relatively stable chlorophyll levels.
- **CONDUCTIVITY/CHLORIDE:** Conductivity levels were elevated at all stations except Main Beach and were greater than the state median. Visual analysis of historical data indicates increasing (worsening) epilimnetic conductivity. Chloride levels were slightly greater than the state median.
- **E. COLI:** E. coli levels were well below state standards for public beaches and surface waters.
- **TOTAL PHOSPHORUS:** Deep spot phosphorus levels were low and below the state median. Near shore phosphorus levels were also relatively low. Visual inspection of historical data indicates relatively stable epilimnetic phosphorus with moderate variation between years.
- **TRANSPARENCY:** Transparency improved in 2013 and the Secchi disk was visible on the lake bottom. We hope to see this continue! Visual inspection of historical data indicates relatively stable transparency.
- **TURBIDITY:** Turbidity levels were relatively low at all stations.
- **PH:** pH levels were sufficient to support aquatic life, however historically have decreased below desirable range 6.5 – 8.0 units.
- **DISSOLVED OXYGEN:** Dissolved oxygen levels decreased slightly toward the pond bottom, but generally were sufficient to support aquatic life.
- **RECOMMENDED ACTIONS:** Lake conductivity has increased since monitoring began, and epilimnetic chloride is slightly greater than the state median. The increased conductivity may be due to winter road maintenance activities. It is recommended to encourage local road agents to obtain a Voluntary NH Salt Applicator license through the UNH Technology Transfer Center's (T2) Green SnowPro Certification Program to try and reduce excess salt application. Increase monitoring frequency to three times per summer to better assess summer water quality and decrease variability in annual trends.



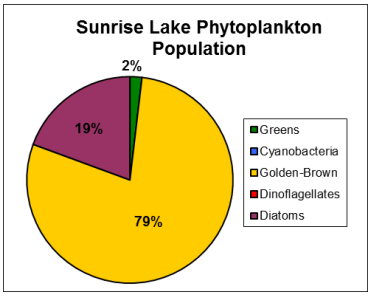


Table 1. 2013 Average Water Quality Data for SUNRISE LAKE

Station Name	Alk.	Chlor-a	Chloride	Cond.	E. Coli	Total P	Trans.		Turb.	pH
	mg/l	ug/l	mg/l	uS/cm	#/100ml	ug/l	m		ntu	
							NVS	VS		
Bartletts Cove				77.9	10	5			0.72	6.82
Epilimnion	5.60	4.27	14	79.0		6	3.50	3.50	0.80	6.82
Hypolimnion				78.7		8			1.27	6.66
Hampshire Brook					10					
Hampshire Shores					10					
Hampshire Shores Launch				78.7	10	6			0.76	6.85
Johns Beach				79.8	8	9			0.75	6.73
Main Beach				41.3	8	12			1.07	6.83
Nicola Beach					2					
Nicola Beach 1					8					

NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: < 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: 6.5-8.0 (unless naturally occurring)

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation	Parameter	Trend	Explanation
pH	N/A	Ten consecutive years of data necessary.	Chlorophyll-a	N/A	Ten consecutive years of data necessary.
Conductivity	N/A	Ten consecutive years of data necessary.	Transparency	N/A	Ten consecutive years of data necessary.
			Phosphorus (epilimnion)	N/A	Ten consecutive years of data necessary.